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EDITED BY SAMUEL HAZARD.

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From the Philadelphia Gazette and Intelligencer.

LEHIGH COAL.

Sir,—I send you for the Philadelphia Medical Museum, an account of some experiments made with the Lehigh coal, and the distinguishing characters of this combustible body.

Other inflammable substances, will no doubt be discovered in the United States, and should they be submitted to a proper course of experiments, bodies apparently of the same nature may be distinguished from one another, important services be rendered to our citizens, the arts be benefitted, and a foundation laid for a system of American mineralogy.

With respect, I am, dear sir, your humble serv't,

JAMES WOODHOUSE.

To Dr. John Redman Coxe.

Philadelphia, May 3d, 1805.

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This coal is found in immense quantities, in Pennsylvania, in the county of Northampton, near the river Lehigh. It is of a shining black color, and stains the hands very little. Its fragments are tabular, as may be seen particularly after it has been submitted to heat.—Its specific gravity is 1.6181. It burns with very little flame, and no smoke, is with some difficulty kindled, and requires a considerable draught of air, to keep up its combustion.

When perfectly consumed, it leaves behind a small portion of white siliceous earth, containing no potash, and sometimes colored brown, by means of iron. It does not contain any sulphur.

Neither the sulphuric, nitric nor muriatic acids act upon it.

It does not take fire when reduced to an impalpable powder, and passed through the flame of a candle.

A piece of it red hot, containing about eight cubic inches, was placed in forty-eight ounce measures of atmospheric air over water, and suffered to cool. Upon passing one measure of this air over lime water, in the eudiometer of Fontana, it gave one per cent. carbonic acid gas. The remainder of the air, after being freed from the fixed air, was reduced in purity from 100 to 85.

One cubic inch of it red hot, suspended in ten ounce measures of oxygen gas, brightened very little.

The focus of an eleven and a half inch lens was directed upon a lump of it, contained in a bell glass, in twelve ounce measures of oxygen gas, over water, when it burnt with a considerable flame, and nearly in the same manner, as the James's river coal, when a blast of atmospheric air is thrown upon it. The gas was afterwards reduced in purity, and contained fifty per cent. of carbonic acid gas.

A quantity of the coal red hot, being extinguished under water, produced an inflammable air, without any mixture of fixed air.

Two measures of this gas, and one of oxygen air, exploded by the electric spark, in the eudiometer of Volta, left behind one measure of hydrogen gas, containing ten per cent. carbonic acid gas. Two measures of each of the gases, by the same means, were reduced to something more than a measure of oxygen air, which was mixed with fifteen per cent. of the fixed air.

Four ounces of it, reduced to a course powder, were exposed in an earthen retort, to a red heat in one of Lewis's black lead furnaces, when it yielded three hundred and sixty ounce measures of hydrogen gas, of the same kind as that produced by extinguishing it, when red hot, under water.

The same coal, taken from the retort, and sprinkled with water, and exposed a second time to heat, afforded thirty ounce measures of inflammable air, in the first portions of which the carbonic acid was barely perceptible.

The steam of water was transmitted over the coal red hot, confined in a porcelain tube, and it gave hydrogen gas in torrents, mixed with ten per cent. of fixed air.—Two measures of this hydrogen gas, after the carbonic acid had been separated from it, and one of ovygen gas, left near a measure of inflammable air, mixed with fifty per cent. of fixed air.

A fire was kindled at half past 11 o'clock, by placing a quantity of the Lehigh coal, upon a stratum of common charcoal, in a powerful air furnace, which was then filled with equal portions of the two substances.—As fast as the charcoal consumed, the Northampton coal was added, and at half past one, the furnace was completely filled with it, and two thirds of it red hot. At four, the coal was half consumed, and it continued burning, until 11 o'clock at night.

Five of Wedgwood's thermometer pieces, put in crucibles made of porcelain, were deposited in different places among the coal, that they might descend in different directions, and some of them be exposed to the greatest degree of heat. When they were cool, being measured by the guage, they gave 70, 77, 150, 156 and 159 degrees.

125 is the highest heat Mr. Wedgwood could ever produce, in a common smith's forge, 160 in an air furnace eight inches square. Brass melts at 21—copper at 27—silver at 28—gold at 32, and cast iron at 130 of this thermometer. The welding heat of iron is 125.*

James's river coal, submitted to an experiment of the same kind, burned out in four hours

A fire was made with the Lehigh coal, in a smith's forge, and two thick bars of iron were placed in it, and welded with great ease by the proprietor of the furnace.

The smith, his journeymen, and bystanders were convinced, that the heat was much clearer and greater, than that of the James's river coal.

As the Virginia coal burns with flame, and much smoke, a vast portion of this combustible substance, and the heat generated by it, is lost by passing up the chimney.

It appears from some of these experiments, that this coal does not unite to the base of oxygen gas, with as much rapidity as common charcoal, and that it decom-

* Description and use of a thermometer for measuring the higher degrees of heat, by Josiah Wedgwood, or Phil. Trans. vol. 72d.

poses water. Its flame, consisting of oxide of carbon or carbonated hydrogen gas, arises from this decomposition.

When it is exposed to a red heat, and contains little water, it gives rise to a peculiar species of inflammable air, without any fixed air; but when the steam of water is transmitted over it, in a red heat, the production of carbonic acid gas is very considerable, and when the hydrogen gas thus obtained is fired with oxygen gas, the fixed air generated, amounts to thirty five per cent. more than when it is procured from coal, united to a small quantity of water.

According to the opinions now generally adopted by the philosophers of Europe, the gases, when little water is mixed with the coal, must consist of oxide of carbon and carbonated hydrogen gas.

It will be said, the oxygen of the water, unites to parts of the coal, and forms oxide of carbon, while its hydrogen escapes, dissolves a portion of the coal, and makes carbonated hydrogen gas.

This explanation is far from being satisfactory, for no oxide of carbon can be detected in the gases produced by extinguishing this coal when red hot under water, or by submitting it to heat in an earthen retort.

The Lehigh coal promises to be particularly useful, where a long continued heat is necessary, as in distilling, or in evaporating large quantities of water from various substances; in the melting of metals, or in subliming of salts;—in generating steam to work steam engines;—in glass houses, and in common life, for washing, cooking, &c. *provided the fire places are constructed in such a manner, as to keep up a strong draught of air.*

UNIVERSITY OF PENNSYLVANIA.

(Continued from page 213.)

CHAPTER IX.

Organization of the University after the union of the Schools.

To effect a satisfactory arrangement of the internal affairs of the institution was found by the trustees to be a task of some difficulty. It was evidently impossible, with the limited funds under their control, and with a proper regard to the best interests of the school, so to expand its establishment, as to embrace, in its various offices, all the professors and teachers who had been connected with the late college and university; and yet, a sense of the justice due to these gentlemen, as well as private feelings of friendship or regard entertained towards them by individual members of the board, demanded that as many of them should be included in the new scheme as might in any way be consistent with the great object, for the attainment of which they were to be employed. Between these opposing considerations, to hit upon the just medium, required the exercise of cautious reflection, and a spirit of mutual condescension among the friends of those candidates whose conflicting claims were in the way of a proper settlement. At length, however, a plan for the seminary was prepared, which, though not without some opposition, was ultimately adopted.

It was determined that, beside the charity schools, there should be three departments; those of the arts, of law, and of medicine. In the department of arts, five separate schools were instituted, to be placed under the care of six professors, assisted by as many tutors as might from time to time be deemed necessary. The first school was to consist of two philosophical classes, to be taught respectively by two professors; the one of natural philosophy, the other of moral philosophy. The four remaining schools were each to have a distinct professor; the grammer school, a professor of Latin and Greek; the mathematical school, a professor of mathematics; the English school, a professor of English and the belles-letters; and the German school, a professor of the German and oriental languages. To fill the six professorships thus established, three individuals were to be chosen out of each of the former faculties, in compliance with that provision of the act of union, by which the trustees were bound to select the officers of the university equally from the two seminaries.

According to the regulations above detailed, the following gentlemen were appointed to the chairs respectively connected with their names;—Dr. Ewing to the chair of natural philosophy; Dr. Andrews to that of moral philosophy; Mr. Davidion to that of Greek and Latin; Mr. Patterson to that of the mathematics; Mr. Rogers to that of English and the belles-letters; and finally, Dr. Henry Helmuth, the successor of Mr. Kunze in the late university, to that of the German and oriental languages.* At a subsequent election Dr. Ewing was chosen provost, and Dr. Andrews vice-provost.

From the above statement, it appears, that only two of the late professors, Dr. Magaw of the university, and Dr Smith of the college, were omitted in the new appointments. The former of these gentlemen, understanding that by becoming a candidate he might interfere with the interests of his friend Dr. Andrews, generously declined a nomination; the latter, though supported by a large number of the trustees, had, however, a majority opposed to him, and was now finally separated from an institution, with the infancy of which he had become associated in early life, whose youth he had strengthened and adorned in the vigour of his age, and whose untimely decay, now in his declining years, was another link in the chain of sympathy by which it had so long been connected with his fortunes. The age and infirmities of the late provost were probably thought to unfit him for the superintendence of a great seminary, in which vigour of authority must be conjoined with extensive knowledge and talents for instructing; and an inferior station could hardly have been offered with propriety, or accepted without degradation. It is possible, however, that a little leaven of old political animosity may have lurked in the minds of those who opposed him, and mingling with the more obvious motives, have committed to them a force and influence which they might not otherwise have possessed. Yet this feeling, if it existed at all, must have been feeble; for no asperity marked the official proceedings, and every disposition was displayed to do, in whatever regarded pecuniary matters, all that justice could require. The doctor was allowed to retain, for one year, free from rent, the house which he had occupied as provost of the college; his claims upon the institution to the amount of nine hundred pounds were admitted and adjusted; and an annuity of one hundred pounds, formerly granted in consideration of his services in England, was now secured to him for life. The intimate connection of the affairs of the old college, in all its vicissitudes of good and bad fortune, with him who was its first and last provost, has necessarily brought before our view many events in the life of that prominent individual; and circumstances peculiar to himself—his learning, his talents, his public-spirited exertions, and the large space which he filled in the esteem and affection of a numerous and most respectable acquaintance—give these events a value in narration, which would, perhaps, have justified us in presenting them to the public in still more minute detail than we have deemed necessary merely for the illustration of this historical sketch. It may not be amiss to state, in taking a final leave of the venerable provost, that his life, already far advanced at the period of his separation from the institution, was protracted to the year 1803.

* The German school was maintained but for a short time, being either inadequately supported, or not found productive of those advantages which were originally proposed.

In the department of law, the regulations which originated with the late college, were still maintained, and Mr. Wilson was continued in his professorship. But the place seems to have been nominal; for no salary was attached to it, and sufficient encouragement was not afforded by students to compensate the trouble of a regular course of lectures. To the present time, instruction in law continues, on paper at least, to be a part of the scheme of the university. In the year 1817, attention was called to the subject by the annunciation of a course from Charles W. Hare, at that time professor; and a respectable attendance was commanded by the high and well merited reputation of that accomplished lawyer. I am not aware, however, that the effort was continued beyond one season; and it has not since been repeated.

It has before been stated that a complete history of the medical school does not constitute a part of our present design. I shall now, therefore, merely mention the names of the gentlemen who were chosen professors in this department. The new faculty was composed of William Shippen, professor of anatomy, surgery, and midwifery; Caspar Wistar, adjunct professor of the same branches; Adam Kuhn, professor of the practice of physic; Benjamin Rush, professor of the institutes and clinical medicine; James Hutchinson, p ofessor of chemistry; Samuel Powell Griffitts, professor of materia medica; and Benjamin S. Barton, professor of natural history and botany. Of these gentlemen, the first six were chosen equally from the late college and university; the seventh, though nominally a member of the faculty, was not placed on the same footing with the others as, by a resolution of the board, attendance upon his lectures was declared not to be an essential requisite for obtaining the medical honours.

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CHAPTER X.

Account of the Professors of the University.

It will be most convenient for the sake of avoiding confusion in the subsequent narrative of events, to pur sue at once down to the present time, the succession in the faculty of arts, without immediate reference to the particular situation of the seminary at the period of each new appointment. As the mere name of an individual is a blank to those unacquainted with his person, character, or history, a few condensed biographical notices will be necessary, in order that correct conceptions may be formed of the condition and merits of the institution of which the subjects of the proposed notices were the conductors.

The Rev. Dr. John Ewing, the fisst provost of the university, had risen by his own exertions from very humble beginnings. The son of a farmer of moderate circumstances in Maryland, and one of a numerous family, he had neither, when a boy, the advantages of a regular education, nor, in his manhood, the assistance of any influential relatives to push his fortunes in the world. Gifted, however, with a strong propensity to scientific pursuits, he improved the slender opportunities which were afforded him in his native place by industrious and eager application; and when old enough to enter upon an independent course of life, left his father's house, to seek elsewhere the means of instruction and support. Both objects were secured by an engagement which he formed, in the double capacity of pupil and assistant, with Dr. Allison, who then taught a private school, with much reputation, in the province of Pennsylvania. Such was his diligence in his new station, and such the extent of his acquirements, that on application for admission to the college at Princeton, he was not only received in one of the higher classes, but was also employed as a tutor; and was thus enabled to continue his plan of improving himself, and of earning a livelihood by assisting in the improvement of others. Having obtained his degree, he devoted himself to the study of theology; and returning to Dr. Allison, now vice-provost of the college of Philadelphia, qualified himself, under his instruction, for admission into the ministry. His first connection with the institution, over which he was ultimately called to preside, took place soon after this period. The absence of Dr. Smith in Great Britain, on the business of the college, having occasioned a temporary vacancy in the faculty, Mr. Ewing, though then only twenty-six years old, was thought qualified to supply his place in the charge of the philosophical classes. Shortly afterwards, he entered into the pastoral office as minister of the first Presbyterian congregation of Philadelphia, to which he continued attached during the remainder of his life. It was in consequence of this station that he became one of the trustees of the university, founded by the legislature upon the ruins of the college; and his elevation to the office of provost, while it was due to his attainments in learning and science, was undoubtedly facilitated by his known attachment to the principles of the revolution, and to the independence of his country.—That he should have countenanced the injury done to his former friends, and even been willing to partake of their spoils, is only a proof that the best men, by the violence of party excitement, are apt to have their vision so perverted, that an act of injustice, if it promote the great political object in view, assumes in their eyes the colour of necessity, if not of virtue. It has been seen, that on the union of the schools, his claims to the provostship were thought to over-balance the high qualifications and long services of Dr. Smith. He continued to preside over the university, and to perform the duties of professor of natural philosophy till 1802, when he died, at the age of seventy-one years. But for a short time before the close of his life, he was disabled by ill health from that steady and vigorous application to the business of his station which had characterized the early period of his employment, and by which alone he could compensate the university for that unfortunate division of his time and attention, which his adherence to the pastoral office rendered necessary. From the accounts which are left of Dr. Ewing, he appears to have been characterized rather by strong judgment and indefatigable application, than by great genius or brilliant imagination. As a mathematician he was thought not to have a superior in the Union. His classical attainments were highly respectable, and by a fondness for biblical researches, he was led to devote much time to the study of the Hebrew language. While the extent of his acquirements commanded the respect of all, the mildness and goodness of his character, and the excellence of his social qualities secured him the kindness and affection of his companions. On a visit which he paid to Great Britain, before his elevation to the provostship, he was received with the highest marks of favour in the literary circles of Edinburg and London, where he acquired the friendship of several distinguished men, particularly of the celebrated historian Dr. Robertson, by whom he was remembered affectionately to the time of his death. It was on this visit that he received, without solicitation, the title of Doctor of Divinity, conferred on him by the university of Edinburgh. The lectures on natural philosophy which he delivered to the classes under his care, were printed after his death, and, though at present out of date, attracted considerable attention at the time of their publication.

The place left vacant by the death of Dr. Ewing, was not filled by a new appointment till the year 1806, when John M'Dowell, L. L. D., of Annapolis in Maryland, was induced to resign his station as principal of St. John's College, in order to accept the professorship of natural philosophy in the University of Pennsylvania, which was offered him by a unanimous vote of the board of trustees. In the commencement of the following year he was elected provost: but the state of his health was found to be incompatible with the duties

he had undertaken to perform; and in little more than three years after entering the institution, he retired into the country, and left to the trustees the embarrassment of another choice. He afterwards evinced his attachment to the school, by supplying a temporary vacancy occasioned by the resignation of his successor; and still later by the bequest of his books, which now form a valuable part of the library belonging to the institution.

At the period of Dr. M'Dowell's retirement, Dr. Andrews had been vice provost for nearly twenty years; and his services both in the college and university, together with the respectability of his attainments and character, entitled him to what little addition of honour and emolument was to be derived from his elevation to the higher post. A native of Maryland, he was, at the age of seventeen, sent to receive his education in the college and academy at Philadelphia, where he graduated A. D. 1765, and was immediately employed as a tutor in the German school; thus beginning his career in the lowest station of that institution, in the highest office of which it was destined to close. Having qualified himself for the ministry, and received regular ordination in the Episcopal church from the bishop of London, he entered into the service of the celebrated English "Society for propagating the Gospel in foreign parts;" and, in the capacity of a missionary, preached at different places in the interior of Pennsylvania and Maryland. The revolution found him settled with a congregation in the latter of these provinces; but as his political sentiments were not exactly accordant with those of the great majority of his parishioners, his situation soon became so uncomfortable as to induce him to remove to Yorktown, where he maintained himself for many years by the profits of a flourishing school. In 1785, he accepted an invitation to take charge of the Episcopal academy then just established in this city, which he continued to superintend, till, upon the revival of the college and academy, he was induced to become a colleague of his former master, Dr. Smith, in the management of the philosophical school. I have already spoken of his long services in the university. In December 1810, he was unanimously elected provost; but his health now began to give way, and he was compelled to withdraw from the institution, after having enjoyed his elevation little more than two years. Though not described as a man of splendid abilities, Dr. Andrews was highly esteemed as a first rate classical scholar, and an excellent teacher. The works he has left behind him are the living records of his diligence and skill—they are the numerous men of note in the various walks of professional life, the foundation of whose reputation was laid in the instruction they received from him in their youth.

In reply to the letter in which Dr. Andrews, a few months before his death, announced his desire to resign his station in the university, the trustees expressed their high sense "of the unremitting industry and great ability with which he had successively filled the offices of provost and vice-provost;" and communicated their unanimous resolution that the salary which he had hitherto received should be continued to him during the remainder of his life. The Rev. Frederick Beasley, the present learned and respected provost, was chosen to succeed him in July, 1813.

Having spoken of the successive principals of the university, it remains that I should briefly notice their several co adjutors. It will be remembered that Robert Patterson was one of those who were selected from the faculty of the late university, with which he had been connected from its origin, first in a subordinate capacity as a teacher in the mathematical school, and afterwards with the title and privileges of professor. Few teachers in this city have passed through a career at once so long, so uniformly correct, honourable, and prosperous, as that which prudence and fortune combined to mark out for this gentleman. Though an Irishman by birth, he came to this country before the revolution, and possessing therefore all the rights and feelings of a citizen, exhibited, throughout the course of his life, a warm attachment to our republican institutions, and a passionate interest in our national honour and greatness. Some previous experience in the art of teaching, and a skill in the mathematics which was the natural result of diligent application, great mental accuracy, and clearness of intellect, fitted him well for the chair, which, without the extraneous influence of friends and relatives, they enabled him to attain. To the professorship of mathematics, after the death of Dr. M'Dowell, he united that of natural philosophy; and in the year 1810 was made vice-provost, in the place of Dr. Andrews. Independently of his emoluments from the university, he for many years enjoyed a considerable salary as president of the mint. Thus comfortable in his circumstances, he was enabled, in the decline of life, to withdraw from the fatigues of his professorship, and to seek that repose which was now essential to his tranquillity. Testimonies of the public esteem followed him into retirement. The degree of Doctor of Laws was conferred upon him by the institution which he had so long and diligently served; and in the presidency of the philosophical society, to which he was appointed on the death of Dr. Wistar, he received the highest literary honour in the gift of any association on this side of the Atlantic.

At the time of his resignation, a favourite son had been chosen to supply his place till a regular appointment should be made. He lived not only to witness the confirmation of his son in the professorship, but to experience, from his honourable exertions and well merited reputation, the purest gratification of which the parental heart is susceptible. To crown the felicity of his lot, he had united the Christian with the philosopher; and, at a good old age, went down to his grave, with the full assurance that he should rise again to a happier and more exalted existence. Dr. Robert M. Patterson, the present vice-provost and professor of natural philosophy, succeeded his father, A. D. 1813.

Of the professors who belonged to the college before its overthrow in 1779, Mr. Davidson alone had retained his station through all the subsequent changes. In the superintendence of the academy of Newark in Delaware, he had exhibited such evidence of his familiarity with the learned languages, and of his abilities as a teacher, that on the death of Mr. Beveridge, he was thought qualified to supply the place of that accomplished scholar, and was invited towards the close of the year 1767, with offers too favourable to be resisted, to take charge of the Latin school. That his talents continued to be held in high estimation is evinced by the fact, that in each successive change of the institution, care was taken to secure his services. The same fact speaks favourably of the prudence and general moderation of his character, by which he was enabled to steer through the embarrassments of a most agitated period, without either striking against the prejudices and passions which beset him on all sides, or suffering himself to be carried away by the violence of the currents which swept across his course. In the same tenour of usefulness and respectability his life ran evenly on, till at length the debility of old age overtook him, and rendered a retirement from active duties advisable on account of the university, and necessary for his own comfort. Upon the occasion of his resignation, the board of trustees, expressing the "high regard and respect" which they entertained for him, resolved that "in consideration of his long and faithful services," he should be allowed an annuity of two hundred and fifty pounds per annum, and the use of the house which he then occupied, during the remainder of his life. Mr. Davidson resigned in February, 1806; and in the month of May following, James G Thompson, the present excellent professor of the Latin and Greek languages, was appointed in his place.

The Rev. William Rogers, professor of English and the belles-letters, was a clergyman of the Baptist church. He had served during the revolution as chaplain in the army, and afterwards had the charge of a congregation in this city. His office in the university, though nominally on a footing with the other professorships, was in fact regarded as less essentially connected with the interests of the seminary, and therefore commanded less both of influence and emolument. Of so little importance indeed was it considered, that, in a change of regulations which took place in the year 1810, the trustees resolved that it was expedient to suppress it: but, at the same time, unwilling to wound the feelings of Dr. Rogers, they determined that it should remain in its former condition till after the death or resignation of that gentleman. The latter of these contingencies was soon realized. Unwilling that the institution, from a regard to his convenience, should continue to suffer an unnecessary burden, he withdrew from it altogether, and left the board at liberty to make whatever arrangements they might deem most salutary. Dr. Rogers, after surviving all his former colleagues, died recently at an advanced age.

(To be continued.)

From the United States Gazette.

NEW PRISON IN MOYAMENSING.

In a few days, the prisoners will be removed from the prison in Walnut street to their new abode in Moyamensing. We have thought that the great curiosity which many of our friends of both sexes have manifested, to visit the splendid building, so creditable to the liberality of the people and the taste and labors of the distinguished architect, Thomas U. Walters, Esq would warrant us in occupying a column, even in these times of "pressure," in describing what hereafter few, we hope, will be able to testify of "as what they have seen." We have, therefore, derived the subjoined particulars from the most authentic sources:

THE PHILADELPHIA COUNTY PRISON,

Is situated on the Passyunk road, about one mile south of the city.

The whole establishment was designed by Thomas U. Walters, architect, and executed under his direction. The corner stone was laid on the 2d day of April, 1832, and the buildings are now ready to be occupied.

The width of the front on Passyunk road is 310 feet, by 525 feet in depth. The entire façade is designed in the castellated style of architecture, a style peculiarly appropriate for the purposes of a prison. Towers are here seen rising above towers, and battlements above battlements, forming a magnificent pile of nearly eighty feet in height. The various parts of the whole mass beautifully harmonize with each other, and produce what may with propriety be styled *the poetry of architecture.*

The whole façade is composed of a blue Sienite obtained from the Quincy quarries in the state of Massachusetts.

The appropriateness and elegance of the design, the excellence of the material, and the beauty of the workmanship, are alike worthy of admiration.

The front consists of a centre building, surmounted by an octagonal tower, and flanked by two wings. These wings are terminated by massive octagonal towers. Bastions are placed on the extreme corners of the front, with wing walls connecting them with the octagonal towers.

The centre building stands 10 feet in advance of the wings, and is three stories in height. The width at the base is 53 feet, and at the top 50 feet, diminishing by regular offsets at each story. These offsets are capped with a projecting belt.

On each corner of this building, there is a circular projecting warder tower, of five feet four inches in diameter, commencing at 10 feet below the top of the wall, and extending five feet above it. The front is crowned between the towers with projecting embattled parapets, supported on corbiels. The warder towers are finished in the same manner.

The octagonal tower which crowns the centre building, is 14 feet in diameter, and extends to the height of 77 feet above the ground. The top is finished with a projecting parapet, pierced with embraseurs.

All the heads of the windows in the front are made in the form of the Tudor arch, decorated with architraves and labels, and the sashes are finished with appropriate tracery.

The wings are each 50 feet in width, and two stories in height. There are two principal gates of entrance into the prison, one of which is placed in the centre of each of these wings. The gates are 10 feet wide, and 17 feet in height, with a light over the top, secured by a strong wrought iron port-cullis.

The wings and the octagonal towers which flank them, are pierced with slip windows, and crowned with embattled parapets, in the same manner as the centre building.

The bastions on the extreme angles of the front are 15 feet wide at the base, and diminish to 13 feet in width at the top. They are finished with an embattled parapet, in the same manner as the rest of the work. The whole prison is arranged in two separate divisions; one part is intended for untried prisoners, and the other for convicts whose term of service does not exceed two years.

There are 408 separate cells, which are built in two blocks of three stories in height, extending from each wing, at right angles with the principal front. The cells open into a spacious corridor, occupying the centre of each block. The corridors are 20 feet wide, and extend the whole length and height of the building. There are lighter vertical windows placed above the roofs of the cells on either side. The approach to the second and third stories is by means of galleries of 3 feet 9 inches in width, supported on strong cast iron brackets, the stairways are formed of granite. The clerk has an office at the head of each of the blocks of cells, from which he is enabled to see every cell door in the whole range at the same moment.

Each cell is nine feet wide, thirteen feet long, and nine feet high, substantially arched with bricks and floored with oak plank. They are all furnished with separate hydrants, water closets, flues for ventilation, flues for admitting fresh air, (which may be regulated by the prisoners) and flues for admitting warm air, which is generated in furnaces placed in the cellar of the building. These furnaces are entirely of a novel and ingenious construction, and, by an experiment made during the extreme cold weather of last winter, the success of the plan was fully proven. The following is an extract on this important subject, from a report made by the architect to the commissioners for erecting the prison, dated January 7, 1835.

"We are now engaged in constructing the furnaces for heating the cells, one of which has been completed, and in operation for several weeks; this furnace warms sixteen cells in each story, making in all forty-eight cells.

It affords me great satisfaction in being able to say, that my expectations are fully realized in the performance of this furnace. To-day being as cold as any day we have experienced for several years, I was induced to try the temperature of the cells that are warmed by this furnace. The following is the result of the experiment:

In the yard of the Prison, the thermometer stood at

5 deg. above zero.—In the cell nearest the furnace this being

In the 1st	cell	in the first story	it stood	at 58	degrees
16th	do	do	do	55	do
1st	do	second story	do	59	do
16th	do	do	do	58	do
1st	do	third story	do	60	do
16th	do	do	do	61	do

This last cell is situated at the greatest distance from the furnace. The experiment was tried with all the cell doors open. By having these closed, several degrees will be added to the temperature of the cells. The animal heat of the inmates will also have a tendency to raise the temperature.

The experiment, therefore, fully proves that an equality of heat has been attained in the cells, notwithstanding their various distances from the furnace, the greatest difference being but 6°, and that difference is found in favor of the cell most remote from the fire. We are also satisfied that there is quite as much heat as the health and comfort of the prisoners will require.

Each cell is closed by two doors, one on the inside, and the other on the outside of the wall, they are both secured to a cast iron frame, which extends through the whole thickness of the wall; the inside door is a grating made of wrought iron, and the outside door is composed of wood.

The hydrants and water closets are supplied from twelve reservoirs, placed near the roof of the building; these reservoirs receive the water from Fairmount being 42 feet below the Fairmount basins.

The Kitchen, Bakehouse, Laundry and Bath houses are situated in a separate building, occupying a space of 43 feet wide by 72 feet long, in the yard, between the two blocks of cells, they are approached from both divisions of the prison, by means of covered passages; these passages enclose a private garden, for the use of the keeper's family. The kitchen is furnished with a large steam boiler and four cast iron reservoirs, of 80 gallons each, in which all the boiling for the prisoners will be done by steam. The whole apparatus is admirably constructed.

There are also two other buildings in the yard, between the two blocks of cells, one of which is divided into apartments for turning, coopering, blacksmithing, carpentering, &c., and the other comprises a complete dyeing establishment, with all the necessary boilers, tubs, &c.

The whole of this vast pile of buildings is constructed in the most permanent and durable manner, and its external appearance speaks well the objects to which it is appropriated.

On the ground, to the north of this stupendous edifice, there is now being erected a prison for Debtors; —Mr. Walter is also the architect of this establishment.

The façade is designed in the Egyptian style of architecture, and is composed of red sand stone, obtained from the quarries on the Connecticut river near Middletown. The color of the materials comports well with the style of architecture, and will present a pleasing variety in the public buildings in Philadelphia.

The whole width of the front is 90 feet, and the depth 120 feet; the front entrance is formed by a recessed portico; ornamented by two columns of three feet in diameter, and 12 feet high, the windows are crowned with the massy bead, and cavetto-cornice, peculiar to the style; the top of the building is also finished in the same manner.

This establishment contains twenty-two separate rooms for prisoners, which open into two spacious halls, (one in each story) two rooms for witnesses, and accommodations for a keeper with his family.

This prison will be finished about the first of July next, at which time it may be expected that the Arch street prison will be vacated.

From the United States Gazette.

A VISIT TO THE WALNUT STREET PRISON.

In a very short time, the prisoners will be transferred from the old prison in Walnut street to the new prison in Moyamensing, and then the mass of stone and mortar, which has so long cast a gloom over the corner of Walnut and Sixth street, will give place to a comely array of marble and brick. Unwilling to suffer this remnant of other days to pass away without our seeing its interior arrangements, we, on Friday accepted the invitation of one of the officers to look through the institution.

The arched rooms on the right of the entrance are now occupied by the keeper and the board of superintendents. The files of dockets and records is extensive, and the list of inmates very large. We took occasion to look for the name of the first prisoner. It was Thomas McKnight. His crime had been burglary, and his sentence was "seven years" imprisonment, with forfeiture of goods and chattels." On the wall hangs an iron frame, curiously wrought; its purpose was to encase the body of a culprit who was sentenced to be gibbited, so that he might not fall to pieces, while he

"Hung on high, to poison half mankind."

This prison was, during the occupancy of our city by the British troops in the revolution, their head quarters, and the floors of a considerable part give evidence of the free use they made of the axe in chopping wood. The front rooms were probably occupied by the officers. On the floor is marked a "draft board," and the removal of paper from the wall disclosed the remains of a likeness of George the Third, painted probably by one of the officers, perhaps Andre, as that officer was skilful with the brush.

Passing through the front building, we entered the centre yard, where a vast number of criminals were employed in sawing marble. In one of the long houses, we saw the weavers, the dyers and others, engaged in their several occupations. The tailors and shoemakers and blacksmiths were also busy, and we should think that they suffered less than is generally supposed, they having but little regard for the disgrace attending their situation.

Beyond the range of buildings just mentioned, we found an officer to whose care juvenile delinquents were committed. The number of this class is greatly diminished since the House of Refuge has been established.

One circumstance arrested our attention. The luxuries of green fruit can scarcely be supposed to find their way into a prison, and yet they would be keenly relished there; and to supply a want without violating a law, a great number of convicts had suspended from their windows, boxes of earth in which they had planted various seeds, and these had all apparently brought forth a goodly harvest; so that the hanging gardens of the King of Babylon have a parallel in utility, if not in splendour.

Beneath the eastern wing, projecting into the yard of the prison, is a long arched passage, dimly lighted with one or two lamps fastened to the masonry of the wall. Doorways at the side of this long subterranean chamber opened into dark arched cells, where no ray of light but by the door could find entrance, and where all that is imagined of the solitary and subterranean dungeon holes of feudal castles might be fully realized. Strong, massy chains were fastened to the floor, and the grating, and the thick iron studded doors, now thrown down, showed that an attempt at escape must have been futile. No prisoner has occupied these hor-

rible abodes for nearly forty years. The last prisoner had been thrust in for some crime out of the usual course, his situation not made known to the keeper, and he perished miserably, without being able to make his voice heard. What must have been the sensations of the poor wretch, thus to feel life passing away in the horrors of famine and darkness!! The upper rooms on Walnut street are, we believe, chiefly used for the sick, and so also with one or two in the rear. Beyond these, in the upper story, is a series of cells, wherein are confined several prisoners for crimes of various degrees of atrocity. We passed to this place over a kind of bridge, and it seemed to us a "bridge of sighs;" heavy chains rattled at the doors of the corridors that passed between the range of cells, and numerous heavy bars were removed, and strong locks turned, before the iron doors rolled heavy upon their reluctant hinges. We could see, through the gratings, the miserable prisoner stretched out upon the floor of his narrow abode, little curious to ascertain what had caused the disturbance, certain that it could not reach through the iron of his dungeon, or suspend the steady, galling operation of the deep and just vengeance of the law.

We paused at the grating of a cell, and the gentleman who accompanied us spoke to the inmate. The voice was that of kindness, and it was evident that the prisoner was used to that tone from the keeper. He stepped forward from the dark rear of the cell, and placed himself against the grated door. Ten long years had been passed in durance by this offender against our laws, and a strong iron frame, that had stood up against war and the elements, was yielding as a consequence of inaction. A strong light from an open grate in the passage where we stood, fell on the pallid features of the prisoner, and placed him in bold relief in the dark ground of his unlit cell.

The multitude in the yard and the workshops were busy; they seemed little different from the inmates of an almshouse; their number and movements prevented reflection; but here was food for thought. Hope had almost ceased with the man. Sixteen years of his sentence were yet unexpired; and there was scarcely a ground to expect that he would survive that period in confinement. With this world thus receding, we questioned him of his hopes of that towards which he was hastening. His mind was clouded; there was a lack of early favourable impressions, and he seemed to share in the common feelings of convicts, that his crime had not been more than that of men who had escaped with less punishment, and when we asked him of his sense of guilt towards HIM who was yet to be his judge, the poor man confessed his offences, but so mingled that confession with comparisons of crime, that we feared he saw darkly the path of duty; there was no complaint; much humility, much sense of degradation distinguished his speech, and a deep sense of gratitude towards the keeper who accompanied us was manifest in his manner and language.

Having answered the questions which he put to us on important subjects, with what little ability we had, and added the advice which mankind are more ready to give than to follow, we prepared to depart; a slight flush came to the cheek of the prisoner, as he pressed his forehead against the bars of his cell, and his hand, which long absence from labor and from light had blanched to the lustre of infancy, was thrust through the aperture, not boldly to seize ours, nor meanly to solicit, but rather as if in the hope that accident might favor him with a contact. Man, leprous with crime, is human—and a warm touch of pity passes with electric swiftness to the heart. Tears from that fountain that had long been deemed dried up, fell fast and heavy upon the dungeon floor.

The keeper had moved away from the grate, and we were about to follow, when the prisoner said, in a low voice.

"One word more, if you please. You seem to understand these things. Do the spirits of the departed ever come back to witness the actions and situation of the living?"

"Many people believe it," we replied, "and the scripture says that there is 'joy in heaven over a sinner that repenteth' on earth. It may therefore be true."

"It may be," said the man.—"My poor, poor mother!!"

* * * * * *

In another cell, was stretched out a man whose crimes had some years since, brought him to his present place of confinement. He was reading a work which had a peculiar interest for him, as it was written in prison, and seemed particularly suited to his wants. While in some conversation with this man, we recollected that he could not read when he was on trial, and we felt anxious to know how he had accomplished the task of learning to read, while shut up in a cell, into which no one was admitted with him. The means adopted and the success attending it, are most worthy the notice of philosophers. Some time after this man was sentenced, another prisoner, under capital sentence, was confined in an adjoining cell. He could read, and the clergyman who attended on him left with him a bible, and this, with the devotional books, seemed to afford him so much consolation that he of the neighboring cell was made doubly to feel his deprivation. It was not long, however, before it was determined that the unlettered man should, if possible, have the benefit of reading. He was supplied with a bible, which was opened for him at a particular chapter, say the first of John's Gospel. The one who could read, opened his bible to the same place, and read the verse slowly; he then read the two first words, and his pupil in the next cell repeated the same frequently, and afterwards found the same words in other verses. Several other words in the same verse were got in the same way, and analysed; and thus slowly and surely the light of the Gospel was made to shine into a dungeon, where all circumstances seemed to conspire to spread the darkness of ignorance. Jacotot's French system of instruction is, if we remember aright, not unlike this of the prisoners. Whether it has been as successfully applied, we cannot say.

The western side of the prison house is occupied by the female convicts, who are employed in spinning, sewing, and in other offices suited to their sex. Their rooms were remarkably neatly arranged, and as clean as whitewash and soapsuds could make them. One only was in a cell, and she for some improper conduct in the house.

The prison and its inmates afford matter for deep reflection. We have not space to moralize on the subject. One poor wretch, who was piling wood in the lower vaults, remarked to us, that had he known the deep disgrace of crime, the utter separation from decent men which its commission produced, he should never have stolen. "Had I comprehended all these things," said he, "I would sooner have burnt my hand off than to have stolen a brass farthing."

"Perhaps," said we, with some confidence in our remark—"perhaps if youth were allowed to look upon the utter debasement and misery of the convicted inmates of our prisons, they would avoid the commencement of those crimes which would lead them hither."

"Something more than that is wanting," said the keeper.

The keeper stepped back a few yards, and looking upwards, drew our attention to a poor, miserable wretch, who was looking through the gratings of a sick room.

"The father of that young man was one of the keepers of this prison, and he left his situation, and died a convict in the penitentiary of a neighboring state; and that person, his son, who must have looked in upon

the misery over which his father watched, has, with his brother, been a regular and frequent tenant of this prison."

We felt that while the guilty inmates of a prison should offer the petition, "deliver us from evil," it was most fitting that those who had hitherto escaped crime, should breathe upward the prayer, "lead us not into temptation."

From the Wheeling Gazette.

PENNSYLVANIA IMPROVEMENTS.

Columbia rail road—canal—scenery along the Susquehanna and Juniata—rail-road over the Alleghanies—tunnels—canal to Pittsburgh

Who has travelled upon the great canal and rail-road through the states of Pennsylvania?—Many of your readers doubtless have, and have gazed with feelings akin to my own, upon the scenes of wildness, beauty and sublimity which are strewn along the route so abundantly as to elicit the constant admiration of the beholder. But judging from the general silence upon the subject, I am inclined to believe that all are not aware of the fact that there exists a public work so stupendous in our vicinity, or, if they have that knowledge, have never by their own experience tested its strength and magnificence.—This I have lately been privileged to do, and am possessed of the desire of gratifying myself and others by a brief account thereof in outline.

The length of the structure under discussion is 395 miles, 119 of which are accomplished by rail-road, and the remainder by canal. It is made to traverse the whole longitude of the state, and yet by persevering paralelism with the streams to and from their sources, on both sides of the Alleghanies, it avoids the numerous ridges of those barriers of the west, and by the bold passage of a single chain, leaves the waters that seek the ocean, to company with the tributaries of the mighty Mis-issippi.

From Philadelphia, 82 miles of rail-road carries you to Columbia, on the Susquehanna, which is the point where all the travel to the city, along the interior and frontier roads, crosses the river. In consequence, the locomotives are busied with the constant transportation of multitudes. To say that this course leads through Lancaster county, is a hint sufficient to summon the most exalted ideas of rich fields, meadows and woodlands, tidy homesteads, snug dwellings and a thrifty population every where visible in this garden of the states. The country between Philadelphia and the Susquehanna is proverbially beautiful. Along that river, beauty is alternated by rugged grandeur. Embarking on board a packet at Columbia, you are floated between the river and its lofty shore, separated from the former only by the breadth of the tow-path, which, for miles on the side toward the river, is solid and massive masonry. On the other side of the canal runs the turnpike, and so scant is the interval between the river and the shore, that for the passage of these thoroughfares of trade and travel, the very foundations of the hills have been cut away, and you sail along their bases, with the precipitous crags impending many hundred feet above you.

I passed this portion of the route by moonlight, and I shall never forget it. I stood upon the deck of our boat, whose lazy progress was told by the dreamy monotonous ripple beneath its bows, and looked upon a scene which millions might admire without the power to describe.—The night had come down calm and mild, and the darkness was just sufficient for the happiest effect imaginable upon the scenery—solemnizing, without obscuring its grandeur, like a veil upon a gigantic piece of statuary. The Susquehanna slept before me in its immense bed, guarded by mountains of the most picturesque outline beyond, and sentineled by numerous Islands all wooded and wild. The young moon looked with splendor upon the waters, as if to inspire their slumber with a brilliant dream, while a mass of gilt edged clouds lay strown along the west as for her pillow. Skirting the brow of the mountains, these clouds piled themselves against the north, where, among their dark fastnesses the lightnings flashed like the fiery glances of spirits of the storm. Almost over our tiny boat, beetled the cliffs of the eternal rock in tremendous profusion, and it required no effort of the imagination to perch upon their summits the genius of Romance, musing amid the solitudes of his wildering domain.

Following a close parallel with the Susquehanna, the traveller enjoys a view of all the giant features of the valley through which lie its many windings, and yet is not secluded from a knowledge of its cultivated and charming vicinity. Often does he turn his eye, almost wearied with a continual vision of sublimity, to feast it upon the *civilized* beauties which art has painted upon the face of the wilderness. Rich tracts of improved land, and more unfrequently a flourishing village, vary the scene, until at length the Susquehanna is forsaken for the Juniata, which at its junction with the former, effects the breadth and mien of a mighty river. Hitherto your course has been northwardly,—now it turns to the west, and you wend your way onward amid solitudes as wild, along a stream as romantic, and through plantations as thrifty as any you left behind. Now and then an eagle is observed hovering over the crags where he has built his eyrie, and the bullet of the hunter may not reach him on his perch of pride. The irregularities of the Juniata compel to its frequent passage in order to a more direct course, which is accomplished both by acqueducts and ferries, and its company is kept to its very source among the mountains.

Two days and a half, and 172 miles from Columbia, bring you to Hollidaysburgh, at the base of the Alleghanies, and the "fartherest springs" of the Juniata. Here you prepare to cross the mighty division of the east and west; not with the lumbering coach and sweat of tugging horses, with sleepless eye and wearied frame for three or four long nights of dogwatches; but at a single stage, seated at your ease in the steam-drawn car. The change from the sluggish motion of the boat to the speed of the car, is very acceptable, and this 37 miles of road over the mountains proves an agreeable interlude to the sameness of the journey.

A few minutes completes the transfer of baggage, &c., and then at a round rate you are hurried over a level of three miles to the foot of the ascents. Here the car is tied to a cable which goes upward until it is lost in the distance. The signal is given and you find yourself speeding into more elevated regions by the agency of an invisible power. A short interval and you are again upon a level—another, you are being hauled up a second plain. This is repeated until five plains are surmounted, and you stand upon the summit of the Alleghanies nearly 3000 feet above the plain below. Here the streams that are poured from the bosom of the hills divide on your right hand and on your left—the former to find a long path to the ocean, and the latter to swell the floods of the "father of waters!"

The reflections of the traveller from this position are perfectly unique. Here in the very heart of the lonely and unexplored forest, amid the forbidding solitudes of the mountain wilderness, still the home of the bear, the wolf, and the eagle, where the mossy rocks yet in their rest of ages beneath the shadows of the eternal forests—even here, the hand of improvement has been laid, and the repose of nature is broken forever. Her high places have been leveled for the thoroughfare of a nation's commerce, her secluded fastnesses have been opened to the "garnish blaze of day," and the tall tops of the ancient trees stir with the breath of an age, the going forth of whose spirit is like a whirlwind. Here, where but yesterday, the foot of the wandering hunter had

not been, is seen the long train of heavy cars hurrying onward, laden with the merchandise of the east and west, and making the slumbering echoes of the old woods roar with the noise of their coming. Truly this road may be regarded as a beacon of improvement exalted upon the mountain top for the admiration of the world. What American can stand and cast his eyes over the wide spread country below him, the happy view of whose beauty and resources greet him on the right hand and on the left, and not feel proud of his nation and its growing fame? God grant that we may not forfeit our high privileges by lapsing into sins that shall call down upon us a doom more dreadful than that of Sodom!

Upon the summit level, in a solitude like that of St. Bernard upon the Alps, stands a fine mansion, whose spacious accommodations and welcome cheer invite an hour's delay. Then commences the descent of the mountain, which is accomplished, like its ascent, by five inclined planes. After leaving the fourth, you cross a tributary of the Juniata upon a magnificent specimen of pontic architecture, 70 feet above the stream, which it spans with a single arch of 80 feet. It is beautifully constructed of hewn stone, and curiously contrasts with the wildness of the scenery in whose midst it exhibits its elegance. Three miles hence there rises before you a bold, precipitous ridge, whose steepness forbids its ascent by another plane, and whose sweep far away north and south, mocks all circumvention. There it stands towering 200 or 300 feet above your car. What is to be done? Are you to stop here?—No such thing. Surely you are not going *through* that hill!—Yes, indeed: art brooks no veto. A point is rounded and you see your way 900 feet through the solid rock. The entrance through its elaborate portals reminds you of the descent of Æneas, "ad inferos." This curiosity passed, you descend the last plane, and shortly find yourself at Johnstown, whence your journey is finished by canal.

I like the Indian-named streams of Pennsylvania.—Their appellations are musical as their early springs that tumble among the fastnesses of the hills. They remind you of a people who once sought the wild deer along their shores or shot the light canoe among their nooks and over the rocky bottoms—who roamed "unawed and free" among the forest depths, built the council fire upon the hoary cliff, and waked the war-whoop, on the very site of your path. Their glory is but twilight, yet

> "Their names are on our waters,
> And we may not wash them out."

The Susquehanna and the Juniata tell of them on the eastern side of the Alleghenies, and the Conemaugh, Kiskiminitas and Monongahela on the western. Of the last mentioned rivers, the Conemaugh and Kiskiminitas are tasked for service as canals, for many miles. A dam is constructed so as to set the water back, and a tow path graded along their shores, and then you have the finest naturo-artificial canal imaginable. After leaving Johnstown you are floated *through* another mountain, beneath the farm whose tenant lives 250 feet above you. This second tunnel is 917 feet in length. Indeed, the whole course is fraught with wonders.

At the junction of the Kiskiminetas with the Alleghany, you enter a beautiful country, and not among the least of its charms, is the river itself, along whose bank lies your way. This stream merits the name* bestowed by its long since forgotten admirers, for its waters are clear and shine like silver as they roll with a majestic current between their fertile shores. It strongly reminded me of the beautiful Connecticut. One hundred and four miles from Johnstown bring you to Pittsburg, the city of smoke and dun; and your long voyage, with its many interesting scenes, is finished.

Such, is the Pennsylvania canal and rail-road in outline. Like the Erie canal, it is the work of the state through which it passes; but *un*like that has never been lauded to the stars by every tongue in the nation that can lisp its name. Yet in the view of many who have travelled upon both, it is quite as much deserving. Let those who travel eastward commit to it their conveyance, and I assure them they will stand upon the banks of the Delaware, with an eye well feasted with scenes of grandeur and sublimity, a mind more enlightened upon the immense resources of their country, and a heart which shall throb with more generous pride that they are, and (if they feel aright) with more sincere gratitude to Him who has made them to be—Americans.

*Alleghany signifies "clear water."

PROGRESS OF LEARNING.

To the Editor of Hazard's Pennsylvania Register.

In two late numbers of the Register, those of the 6th and 12th instant, I observe a "History of the University of Pennsylvania." It is pleasant to dwell upon the reminiscence of traditionary or historical facts in relation to the situation and circumstances of the early Colonists of Pennsylvania, and more especially as respects the provisions made at that period for intellectual improvement.

It appears that "in 1689, only seven years after the foundation of Philadelphia, a Public school was established in that city by the Society of Friends, in which school were taught the Latin language, the mathematics, and the rudiments of an English education." But although private schools were not wanting, this for more than sixty years continued to be the only public place of instruction in the Province; and that during this period, the means even of elementary education were very deficient, and that "in the highest branches of knowledge, instruction was accessible only to the sons of the wealthy, who were able to support the expense of a residence abroad, either in the mother country or in one of the older Colonies of New England."

The plan of an academy was drawn up by "our Great Franklin, in 1743." Failing in obtaining the desired cooperation, the scheme was dropped for the time, and the war which soon afterwards broke out between Great Britain and France, prevented its renewal for several years. That in 1744, he entered with zeal upon such measures as he supposed would most promote the success of the project. This was "after the conclusion of the peace of Aix La Chapelle, and the consequent restoration of tranquillity in the Provinces." Twenty-four influential citizens, associated themselves into a *Board of Trustees*, for the purpose of carrying his design into effect, and proceeded to provide funds for the establishment of the Academy.

It was not until the commencement of the year 1751, they were introduced into their new Hall, and the views of the Trustees were at first wisely directed to the communication of that elementary knowledge, which is most essential to the citizens of a rising community, and the acquisition of which is a necessary step, to the attainment of the higher branches: for the present, therefore, they restricted their establishment within the

limits of a simple Academy—in which were embraced, one school for the *Latin*, one for *English*, and one for Mathematics. The charter of Incorporation was granted by the proprietors, on the 13th of July, 1753, to the Trustees of the Academy and Charitable school of the Province of Pennsylvania; to the branches before taught, were then added *Logic*, *Rhetoric*, Natural and Moral Philophy.

Amongst the first graduates at that Seminary, was Hugh Williamson in 1757, afterwards amember of Congress from North Carolina, during the Administration of General Washington.

It may be considered as a singular circumstance to remark, and cannot be unworthy of notice, at how early a period learning had been promoted by individual exertion, in what might in those early days, be considered the interior of Pennsylvania, whose Professors "*In the Tranquil shades of lettered Ease*," were unaffected by the wars between Great Britain and France, and who were perhaps unacquainted with the terms of *the Treaty of Aix La Chapelle*. It is now nearly a century ago, and certainly before the year 1749, that the Reverend Samuel Blair, the first Presbyterian Clergyman in Chester county, established a school in Fagg's Manor, in that county, where the Latin and Greek languages, Logic, Mathematics, and Moral Philosophy were taught—and under whose care many distinguished men were educated—amongst others were the Rev. Samuel Davies, afterwards distinguished as the great Pulpit orator of Virginia; the Rev. Samuel Findley, (under whose care the celebrated Dr. Rush received the elements of his education, at his school in Nottingham, Cecil county, Maryland, and also the late Doctor J. Ewing, and many others,) afterwards President of Princeton College, New Jersey; and at which school long after its first establishment, the same Hugh Williamson who is stated to have been one of the first graduates of the Philadelphia Academy, was an Usher or Teacher.

These notices are necessarily traditionary, and are communicated by a descendant of the subject of them, in the third generation.

"A NATIVE OF PENNSYLVANIA."

18th Sept. 1835.

IMPROVEMENT OF THE OHIO.

We have lately published several communications from A. W. Foster, Esq., on the Improvement of the Allegheny and Ohio Rivers, believing that the suggestions therein contained, could be usefully applied to many of our streams. We insert a reply to the letter on the Ohio—and Mr. Foster's answer to Captain Shreeves.

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From the Pittsburgh Advocate.

To A. W. Foster, Sen'r, Esq.

Louisville, 29th August, 1835.

Sir,—I see from an extract from one of your publications relating to the improvement of the navigation of the Ohio river, that you state from information kindly furnished by an experienced Steam Boat Captain, that I have, by adopting the plan of wing dams below the falls of the Ohio, in that river, injured in the most serious manner, the steam boat navigation You will pardon me, sir, for troubling you with this communication in my own defence, and to prevent *public opinion from being led astray* on the subject of the improvement of the Ohio river; particularly at a time when the government is making preparations to commence that important work *at Pittsburg*, through an Agent appointed for that purpose, and whose success I have no doubt will meet the approbation of the intelligent portion of the community, if he is not too severely harassed by meddlers.

The gentleman Steam Boat Captain to whom you allude, has either through ignorance of the subject, or from some other motive, given you untrue information in relation to the effect produced by the construction of wing dams on the Ohio river, below the falls. The first of those wing dams was built at the Grand Chain in the fall of 1830, which, together with the excavation and removal of the rocks from one point designed for the channel (400 yards wide) and deposited at another to form a wing dam 570 yards long, has produced a most valuable and permanent improvement. That point (the Grand Chain) was formerly reputed to be the most dangerous obstruction in the Ohio river. Since 1830, it has not been heard of as a place of danger. In 1831 and '32, wing dams were constructed at the Three Sisters, Scuffletown bar, and French Island shoals, three of the most difficult points in the river at low water. The effect produced at those places, I do assure you, without the fear of contradiction from any man who is at all acquainted with the navigation of the river at low water, has been to double the depth of water. Every man who travelled the river at low water five years ago, must recollect that Scuffletown bar was the terror of both boatmen and passengers; and that since the dams have been built, there has been no difficulty at that or either of the other two shoals alluded to.

In the fall of 1832, a similar dam was begun at the Three Mile Island, near the mouth of Green river.—That dam has not yet been finished, and but little benefit has been felt from its construction. In the same fall (1832) a dam was commenced at the head of Cumberland island. It was continued in 1833 and 1834, during the low water. The object of that dam was to improve the channel of the Ohio river on the left side of the island, and at the same time improve the navigation of the Cumberland river at its mouth. During the progress of that work, some difficulty was experienced by the boats navigating the Oho river, which was unavoidable at a time when the dam was in an unfinished state, and before the bar to the left of the island had washed out sufficiently to admit of a passage on that side of the island. All that difficulty was anticipated by me previous to the commencement of the work, and as much guarded against as possible by leaving a sluice in the dam for the passage of boats. As to the present condition of that dam, I can assure you that at this time and in the lowest water that has been during the present summer, there has been as much water passed the head of the Cumberland island as there has been over any of the other shoals in the river, and no difficulty has occurred to boats when their pilots were acquainted with the channel. To make that work complete and to answer the purpose intended at all stages of the water effectually, it may be necessary to add some 12 to 18 inches to the heighth of the dam. All the other dams above described, require some rock to finish the work, agreeably to the original design. But enough has been done to give a flat contradiction to your intelligent Steam Boat Captain's information. You will also permit me to give my own opinion in relation to the improvement of the river, which is decidedly in favour of the wing dam, and directly opposed to the plan recommended by you. If you excavate through

a shoal in the Ohio or any other stream, to form a channel, without damming at the same time sufficiently to maintain the original level, you must create numerous new shoals in the pools between the shoals.

In the distance of which you speak, between Pittsburg and Wheeling of 40 ripples, on your plan of excavating without dams, instead of making 40 excavations, you will find but few pools so deep that shoals would not appear in them from one end to the other. For example, excavate a channel at Dead man's Ripple, 15 miles below Pittsburg, so as to give a depth of 2 or 3 feet, 50 yards wide as you propose, and you will have a continued shoal to the next ripple above, and so on to Pittsburg. But if you make a channel of sufficient width by forming of dams, and where the bottom of the river is of such formation as not to be excavated by the action of the water, make an artificial excavation. By that means the water will be maintained at its original level in the pools between the ripples, and in many places raised to the heighth of from 10 to 15 inches, and in no place will the upper level be depressed.

In relation to your fourth question, put to steam boat captains and others, relative to the effect produced by the dams erected under my superintendence, I beg leave to inform you, that no difficulty is experienced by steam boats in passing any of them, on account of the increase of current, nor is there any material change in the strength or velocity of the current. There is no chute passing any wing or other dam that has been constructed by me, that all fair running steam boats cannot pass in ascending at the rate of five miles an hour, consequently they do not want a warp.

To show you a proof of the incorrectness of your information, I forward you a copy of Lieut. Bowman's Annual Report of last year. Mr. Bowman is the Inspecting Officer of the Government, and has made examinations of the effect produced by the dams.

You will do me the justice to publish this letter at an early date.

Any suggestions of yours that may give light on the subject of the improvement of rivers, &c., will be acceptable to me, and I must beg leave to request you to forward to me any such that you may think of importance. The enclosed slip is all that I have seen on the subject from you.

I am, sir,
Very respectfully,
Your ob't serv't,
HENRY M. SHREEVES.

A. W. Foster, Esq.
Pittsburg.

REPLY

Of A. W. Foster, to the letter of Cap. Shreeves.

NO I.

Mr. Wilson—The communication from Capt. William M. Shreeves, post marked Louisville, 3d inst. was received a few days since, and is now handed to you for publication; agreeably to his request. The session of the supreme court for the Western District of Pennsylvania, having commenced here, on Monday last, the 7th, has prevented me from paying that attention to the subject matter of this communication which its importance requires. I will nevertheless, at the present time, make some remarks in relation to it, and perhaps be able to collect further materials for the forming of a correct judgment by the intelligent public, who have so deep an interest in the question, before these articles shall be put to press, in which case it would be my desire, that they should all appear in the same paper, that a full view may be taken at once of the whole ground or literally *of the whole water*.

In my first communication to you on the subject relative to the improvement of the navigation of our western waters, which related particularly to the Allegheny river, and published in the Advocate, early in July last, and republished in Hazard's Register of Pennsylvania, on the 25th of the same month, I observed that I was 'trespassing in the free warren of engineers, canal commissioners and contractors,' and I then anticipated an objection by them to adopting my plan, as to the improvement of that river, 'that it would at each ripple save some $20,000 in expense, not give employment to so many hands, nor room for such scientific displays, in the construction of brush dams, and stone dams, and crib dams, &c. &c. as might be agreeable to learned engineers.' It must be apparent, that I did not expect much favor from that class of our fellow citizenss and that, however correct my views might be on the subject, I should have but little reason to expect it, and I apprehend that it is equally apparent that I did not court it. I was not therefore in the least degree surprised that Capt. Shreeves, should in *terms* disapprove my plan. I say in *terms*—for I apprehend it will appear in examination of his communication, that he is willing to effect a compromise on the subject; this will at least be, if not producing good, mitigating evil.

I was therefore, well prepared for objections being made to the plan I had proposed, particularly from Capt. Shreeves, who I had represented as having adopted a wrong theory, and 'by adopting the plan of wing dams on the Ohio, below Louisville, had injured in the most serious manner, the steam boat navigation.' This information was received as stated, from 'an intelligent and experienced captain of a steam boat,' and I will now add, has been corroborated by the declarations of every steam boat captain and pilot, with whom I have since conversed, (and these not a few,) who have been employed in the navigation of that part of the river, and if time and opportunity affords, will procure the statements of some of them before this goes to press, or as soon after as they can conveniently be procured.

I have stated I was well prepared for objections being made to the plan I had proposed, and as I then believed, and now believe, prepared to meet them, fortified as I have been, by the opinion of every steam boat captain and pilot, or other intelligent and practical person with whom I have since conversed on the subject. But I confess I was not prepared to hear from Capt. Shreeves or any other intelligent citizen of this Republic, the expression of a sentiment, that because an agent was appointed by the government, for the purpose of improving the navigation of the Ohio river, and making preparations to commence that important work at Pittsburgh, the examination of the subject and discussing in the public papers, the question, as to the best mode of making this improvement, (of such vital interest to Pittsburg and the whole western country,) should be considered and pronounced to be 'too severely harassing him by meddlers,' and this because Capt. Shreeves has no doubt of his success 'if he is not too severely harassed by meddlers.' Indeed, and has it come to this, that a citizen of this Republic and an inhabitant of Pittsburgh, must pin his faith to the sleeve of Capt. Shreeves, or any other agent the government may choose to send out here, to execute any public work, and not venture to communicate his views to his fellow citizens. This it seems is not a debateable question, at least, under pain of being politely and modestly denounced as an '*harassing meddler*.' We ought to have had previous notice of this. The first fault ought to have been forgiven, hereafter we may know better how, according to the French idiom, 'to carry ourselves.'

In referring to my publication before mentioned, on the subject of improving the navigation of the Allegheny river, and to which reference is made in the subsequent publication on the navigation of the Ohio, and which cannot be well understood without reading the former, and which latter so far from being intended to '*severely harass*' the agent or the government, or

justly to subject myself to be denominated *'meddler,'* a rough draft of it was written, before I knew of such an important personage being in the country; it is true some additions were then made in support of the plan I had contemplated, before publication, from particular inquiries being made and information subsequently received and in consequence of the ruinous plan that I understood was about being adopted.

In the first publication before referred to, respecting the Allegheny, it is expressly stated, that in the overcoming of the obstructions when there may be a ripple making a fall of four feet or upwards, the mode recommended is to make a canal round the falls—that it is only when there are small *natural dams* making ripples of from one to two or three feet, that I propose removing the obstructions in the channel of the river, and "that it would be a matter for the scientific and practical engineer on a careful examination of the river at low water mark to take the soundings of the different pools in order to ascertain how much of the natural dam may in every case be removed, and yet leave sufficient water for all the necessary purposes of navigation, at times of the lowest water." The truth is, it is a plain matter of fact case. Wherever the fall of the water at the ripple is trifling, say not more than two or even three feet, and this is rarely if ever exceeded in the Ohio, unless at the falls and seldom approximated, in all such cases, if the pool above contains deep water, say six to ten feet deep, there can be no difficulty whatever in evacuating the channel to a proper depth, lessening the current in the channel at the ripple, increasing the volume of water there in some degree to be sure, increasing the current in the pool above, but not leaving it so as to expose the shoals, or lower the water so as to injure the navigation, or make the bottom of the boat come in contact with, or even near them.

I do not say, nor have I said that there may not be cases where a river, the Ohio for instance may be spread over so large a surface, with a number of intervening islands—that low dams might not be made between several of them, to collect the water in one channel without materially raising the water in the pool above, or materially increasing the chute, or at least very injuriously affecting it at a small ripple; althongh perhaps in most cases the mere excavation of the channel would answer a better purpose, and at a less expense; the deepening of the channel would *"while the law of gravity remains,"* answer every purpose of conducting in the water, and the dams should only be resorted to in case the pool above was shallow.

A. W. FOSTER.

REPLY

Of A. W. Foster to the letter of Capt. Shreeves.

NO. II.

I have said that "Captain Shreeves was willing to effect a compromise on the subject." How else am I to understand the following sentence: "For example, excavate a channel at Dead Man's Ripple, 15 miles below Pittsburg, so as to give a depth of two or three feet fifty yards wide, as you propose, and you will have a continual shoal to the next ripple above, and so on to Pittsburg; but if you make a channel of a sufficient width, by forming dams, *and when the bottom of this river is of such formation as not to be excavated by the action of the water, make an artificial excavation;* by that means the water will be maintained at its original level in the pools between the ripples, and in many places raised to the height of from 10 to 15 inches, and in no place will the upper level be depressed." Now is not this "artificial" excavation the very thing I want; and is it not the increase of the height of the chute two or three feet by wing dams, thereby increasing the velocity that I object to. Now it appears if we grant captain Shreeves the privilege of a wing dam *ten or fifteen inches high,* (for a wing dam he must have of some size,) he will agree even to "an artificial excavation of the channel where the bottom of the river is of such formation as not to be excavated by the action of the water." Now, whatever may be the formation of the bottom of the river at the mouth of Cumberland river, I believe there is no one in this country would believe the hard gravel bottom at the Dead Man's Ripple, would ever be removed by the action of the water. But I cannot accept of the offered compromise—and I will take the very place selected by Captain Shreeves himself, to test the correctness of our respective principles *in extenso.* Since I received the communication of Capt. Shreeves, I have had an opportunity of conversing with but one experienced man on this subject—he is a resident of this vicinity, was a practical boatman, and the owner of keel boats, and accustomed to boat at all stages of the water, on both the Ohio and Allegheny, thirty-five or forty years ago, and for some twenty years, constantly so engaged. I asked him the depth of the lowest part of the pool immediately above Dead Man's Ripple, and to the foot of the next ripple, *at the lowest stage of the water*—he replied from 7 to 10 feet deep. I next inquired would deepening the channel 3 feet deep at that ripple injure the navigation in the pool above?—his reply was *no, nor deepening it five feet.* The same may be said of all the ripples between that and Pittsburg. I have said this is a plain matter of fact case, and every practical man in the country acquainted with the Ohio, between this and Beaver, will bear me out in the correctness of the statement here given. Why then the necessity of keeping "the pool to its ancient level, or increase its depth 10 or 15 inches more," under such a state of facts, is for Captain Shreeves to explain. With the details of the improvements of Captain Shreeves on the Ohio river, I am not particularly acquainted, and I cannot therefore, be expected to speak—nor as to their effect in general, further than I have been informed from respectable sources, or as they may be *indicated from principle.* The height of the wing dam at the Long Chain is not stated, and therefore, no idea can be formed by me, of the additional height that may have been given to the chute, or the additional velocity to its current. Some excavation, it appears, has been made by the removal of rocks from the channel, which of course must have been beneficial, but what the depth of the pool is, and whether the excavation might have been made sufficiently deep to have superceded the necessity of a long wing dam, cannot be determined *a priori.* This must depend upon the facts of the case.

The same may be said respecting the improvements at the Three Sisters, Scuffle Town Bar, and French Island. I am happy, however, to hear that they answer a valuable purpose, in facilitating the navigation, even if not made on the most economical plan, nor in the best possible mode.

It is admitted by Captain Shreeves, that during the progress of the improvement at Cumberland Island, commenced in the fall of 1832, and continued during the low water in 1833 and 1834, "some difficulty was experienced by the boats navigating the Ohio, before the bar on the left of the island was washed out, sufficiently to admit a passage that side of the island." This difficulty then must have existed at least for the greater part of the last year, and would be *some apparent ground* for the information communicated to me. The question, however, still remains whether an excavation of the channel at that place would not have been better, and cheaper, than a dam at the other side of the island. This, as in the other case, and in every one that can be put, is a *matter of fact question,* depending principally, if not entirely, on the depth of the water in the pool above, unless when from the length of the ripple, or materials of which the bottom was composed, were of more than ordinary difficulty in removal: and also (a circumstance not to be overlooked,) when the chute was very trifling, and the increase by wing dams produce but a trifling impediment to the navigation.

Should it, however, be admitted, even out of *courtesy* to Captain Shreeves, that his mode had succeeded below the falls of Ohio, nay that it was the best plan that could have been adopted, it by no means follows, although he is "decidedly opposed to the plan recommended by me," as to the improvement of the river above the falls, where its character is in a considerable degree changed, that he is therefore correct; and that "if you excavate through a shoal in the Ohio, or any other stream to form a channel, without daming at the same time sufficiently to maintain the original level, you must create numerous new shoals in the pools between the shoals," no matter it would seem how deep the pools may be. The proposition is laid down in the broadest terms, and without exception. Surely it cannot be necessary to take time to expose the fallacy of such a proposition.

I have now, as briefly as I could, although imperfectly noticed captain Shreeves' communication. Since receiving it I have not had the leisure to see, or converse with any of the captains of steam boats, now in this place, or even to ascertain whether the very intelligent steam boat captain, from whom I received the information referred to, is now here—to him and others I will make application for particular information at an early day, and make a communication accordingly, perhaps before this goes to press. This, however I cannot promise, but this I can assure captain Shreeves, that the person to whom I am indebted for the information, is not only intelligent, but a man of character and honor—and would not intentionally, make any mistatement on this or any other subject whatever; and if captain Shreeves will read the essay first referred to on the subject of the improvement of the Allegheny river, he will perceive by an allusion to himself that I would not "abate the tithe of a hair" of the "well earned merit" of his labors and his public services—it is with his theory alone on this subect that I am at war.

A. W. FOSTER.

SUSQUEHANNA AND LEHIGH CANAL.

[From a pamphlet lately published.]

The object of this canal is to secure the best and cheapest route between the principal Atlantic cities and the great western lakes, by making a direct water communication between the rivers Delaware and Susquehanna. It will be located along the Valley of the Nescopec, and will extend from Berwick on the north branch of the Susquehanna to the mouth of Wright's Creek, on the river Lehigh about twenty-six miles above Mauch Chunk. Its whole length will be about thirty-six miles. A reference to the accompanying map will show its connection with Philadelphia by the Lehigh and Delaware (division of the Pennsylvania) Canals, and with New York by the Morris Canal, and also by the Delaware and Raritan Canal. At its other extremity, the north branch division of the Pennsylvania Canal now leads into the heart of the Wyoming coal region, and will speedily connect it to the north, with the Chemung canal, which is already completed (extending the line by the Seneca lake to the great Erie Canal, and of course to Buffalo on Lake Erie) and also with the rail-road which will soon be finished, through the southern tier of counties of New York to some point on Lake Erie, south-west of Buffalo—and westward, with the west branch division of the Pennsylvania Canal, which already reaches the great bituminous coal fields and beds of iron ore, and which will unquestionably be extended at no distant period, to the town of Erie on the Lake. It will thus be seen that all the Canals and Rail-Roads, leading to the north and west branches of the Susquehanna, will become tributaries to the proposed canal, and that it will have the peculiar advantage of offering the choice of the three markets, Baltimore, Philadelphia and New York. Letters giving information of the state of all these markets may meet the trade at Berwick or Northumberland, and if Philadelphia or NewYork be preferred to Baltimore, the boat can pass on to the Lehigh, and be again advised of the state of those markets either at Easton or Bristol, in time to reach the most favourable. The whole route will be adapted to boats of seventy-five tons burthen, without transhipment, and will be open for navigation a month earlier in the spring and later in the fall than the Erie Canal to Albany. This will ensure a large trade to the Canal at those seasons of the year; and the choice of markets, other things being equal, would give it a preference at all times.

The lengths of the several canals connected with the Susquehanna and Lehigh Canal are as follows:—

On the east:		
The Lehigh navigation from Wright's Creek to Easton,		73 miles.
[Of which forty-six and a half miles are already completed, the balance to be completed in 1836.]		
The Delaware division of the Pennsylvania canal, from Easton to Bristol,		60 "
The Morris canal, from Easton to Jersey City at New York,		101 "
The Delaware and Raritan to New Brunswick,		60 "
		"
		294 "
And on the west:		
From Berwick up the North Branch canal,	37 miles	
From Berwick to the West Branch, at Northumberland,	36 "	
From Northumberland up the west branch to the bituminous coal of the Allegheny,	77 "	
	—	150 "
		444 miles.

Making a grand total of 444 miles to furnish business for the Susquehanna and Lehigh Canal as soon as it shall be completed, extending to all the best markets and all the best coal regions in Pennsylvania, and leaving comparatively little to be done to connect with the far west.

Comparison of Routes.

	Baltimore.	Philad.	NEW YORK by Morris.	NEW YORK by Del. & Rar.
1 From Cleveland on Lake Erie, by Akron, Warren, Pittsburg and Union Canal, to		616		710
2 From Erie by Franklin, Freeport, Allegheny Portage, & Union Canal,		565		659
3 From Erie by Clarion River, West Branch Susquehanna, and Union Canal,		541		635
4 From Erie by Clarion River, West Branch Susquehanna, and Susquehanna and Lehigh Canal,		544	567	592
5. From Erie by Clarion River, West Branch Susquehanna, and by Port Deposit,	523	547		641

NOTE.—Route No. 4 is all done except about 218 miles. The passage across the Allegheny ridge will

be effected by a continuous navigation, by means of reservoirs, for which there are great facilities, and the elevation is less than half that of the Portage Rail Road from Holidaysburg to Johnstown.

	Balti-more.	Philad.	NEW YORK, by Morris.	Del. & Har.
1. From Buffalo on Lake Erie by Erie Canal and North River, to N. York,				523
2. From Buffalo, by Erie Canal to Montezuma, Seneca lake, North Branch and Susquehanna and Lehigh Canal,		546	569	594
3. From Buffalo by Erie Canal to Montezuma, Seneca lake, North Branch and Union Canal,		613		707
4. From Buffalo by Erie Canal to Montezuma, Seneca lake, North Branch and Susquehanna River,	597	621		715

NOTE.—The Navigation from Nanticoke Dam on North Branch of Susquehanna up to the Erie Canal is completed, except about 88 miles from Lackawana creek to Elmira.

From the above tables it will be seen that the Susquehanna and Lehigh Canal will form a link in two of the most important and direct lines of navigation, connecting the Atlantic with the great West, and it thus becomes an object of national importance, at the same time that it offers to the Stockholders an almost certain income up to the legal limits.

In the routes from Erie it will be seen that the one by the Union Canal to Philadelphia, is three miles, and the one by the Susquehanna River to Baltimore is 22 miles nearer than by the Susquehanna and Lehigh Canal, to Philadelphia. But the circumstances of Philadelphia being a better market than Baltimore, and having the choice of the additional market of New York by a distance of 40 to 74 miles nearer than by Port Deposit, will give the preference to the new route.

From Buffalo to Philadelphia by the Seneca lake and Susquehanna and Lehigh Canal it is but 23 miles further than by the Erie Canal to New York, while it has an uninterrupted *boat* navigation the whole distance, and it is 51 miles nearer than to Baltimore, and 67 miles nearer than by the *Union Canal* to Philadelphia. The trade of New York city which is bound for the west by any of the lines through Pennsylvania, will undoubtedly take that by the Susquehanna and Lehigh Canal to the town of Erie, which it will reach in only sixty-nine miles more than to Buffalo by the Erie canal, and a large amount will no doubt go in that line in the spring and fall, when the harbour of Buffalo is closed by ice.

Let us now enquire into the nature and extent of the trade of the North Branch of Susquehanna, which will certainly take the new route unless Baltimore will pay a premium of nearly two dollars per ton over Philadelphia.

By reference to the map it will be seen that four-fifths of the state of New York which now furnishes business to the Erie Canal, lies on the south or Pennsylvania side of that canal, and as the Susquehanna and Lehigh Canal route to Philadelphia is only 23 miles further than the Erie canal route to New York, it follows that a point 23 miles south from Montezuma would be equi-distant by the two routes from New York and Philadelphia. It will not then be unreasonable to expect that one-third of the present trade of the Erie canal will take the Susquehanna and Lehigh canal, and at the same rate of toll as was paid on the Erie Canal in 1834, it would pay the proposed canal $42,792.

In the report of a Committee on Canals and Internal Improvements, made to the Assembly of New York, 5th March, 1835, they say, (page 6) "Still our resources are but partially developed, and without regarding the trade of other quarters, it is not too much to anticipate that the (Erie) canal in its present condition, will soon be inadequate to the wants of our citizens. It is estimated that one *seventeenth part only*, of the trade on the Erie Canal, is from parts without the limits of our own State." "Thus far the greater part of the immense country bordering on the upper lakes has been in that course of rapid settlement which makes the demand for home consumption nearly or quite equal to the whole amount of production—and we have as yet seen only the small beginnings of the extensive trade which must very soon flow through the Erie Canal." This language as strongly applies to the Susquehanna and Lehigh canal as to the Erie Canal, and is incontrovertible.

The following certificate of Christian Brobst and others of Cattawissa, gives a striking view of the present trade of the North Branch:

"We, the subscribers, from actual observation, are enabled to, and do hereby certify, that in six days, viz: from the 18th to the 23d of May, inst., there floated down the North Branch of the Susquehanna, past the village of Cattawissa, Two Thousand Six Hundred and Eighty Arks, and Three Thousand Four Hundred and Eighty Rafts. The Rafts and Arks were loaded with shingles, staves, coal, and country produce of all kinds." Cattawissa, May 24, 1833.

In "Packer's report on the Coal Trade, to the Senate of Pennsylvania,"* when speaking of this canal, he observes:

"That a communication will be opened through which will pass the various valuable productions of the Wyoming Valley—of the north Branch of the Susquehanna—of the Gennessee river, and the lakes. And the people inhabiting a large portion of our great rival, be placed several miles nearer to Philadelphia, than their own city, New York." Again, he says:—"A canal, it is ascertained by actual examination, may be made from Berwick on the north branch of the Susquehanna, by the Valley of the Nescopeck to the Lehigh." And again he says of the third or Wyoming coal field: "This coal formation is well defined, and its geological character more *extensively* and advantageously known, than that of either of the other regions. To the eyes of the passing or superficial observer, there would appear little if any variance in the general appearance and characteristic features of these three Coal fields, excepting only in one particular, and that difference is a striking and interesting one."

"The first and second (Anthracite Coal) fields present a thin, barren, sterile soil, peculiar to our mountain lands, small portions of it only, being susceptible of cultivation. The third field presents a rich deep loam, embracing the beautiful and fertile Valley of Wyoming, and one of the most productive and excellent agricultural districts in Pennsylvania—alike rich in its agricultural productions, as abundant in its mineral treasures. The same acre of land may furnish employment for both the agriculturalist and the miner. The different branches of industry therefore, may here, not only be placed side by side, but literally one on top of the other."

It perhaps is not generally known that the principal market for Anthracite Coal is *north* of Philadelphia. Let us then enquire whether the Coal of the Wyoming Valley can compete with that on the Schuylkill in the city of New York, which is the great depot for the northern market.

*See Reg. Vol. XIII, p. 185, &c.

From Pottsville to West Philadelphia is	106 miles.
West Philadelphia by Delaware and Raritan Canal to New York	109
Distance from Pottsville to New York,	215
Nanticoke Dam, which may be assumed as a central point for a large body of the Wyoming Coal, to Berwick on the Susquehanna and Lehigh Canal is	19
The length of the *proposed* Susquehanna and Lehigh Canal,	36
Lehigh Canal to Easton,	73
Morris Canal to New York,	101
Distance from Nanticoke Dam to N. York,	229
Or add, if the route to New York be by the Delaware Canal, and Delaware and Raritan Canal,	25

The Anthracite Coal crosses the Susquehanna 10 or 12 miles below the Nanticoke Dam, making the distance about the same by the Morris Canal to New York, as from Pottsville.

It appears then, there is no difficulty in point of distance, and it is therefore but reasonable to say it would divide the great Coal business with Schuylkill.

But it may be said, that, as Rail Roads have been made, and are making to every leading point in our country, they will supercede all the Canals, and render them useless. We therefore notice them, not from any enmity, but from a necessary self-defence, for however sure we are that any certain plan of operations is correct, if those operations are to be effected by the public, their favourable opinion must be had, or the project fails, however entitled to their support.—This great and interesting subject has been examined at large, under the direction of the Legislature of New York, by their Canal Commissioners, who made their report on the 17th of March, 1835, accompanied by the opinions of three experienced engineers, [for particulars, see Hazard's Register of Pennsylvania, vol. 15, p. 231, &c.] This report contains a statement from 50 canals in England, and 40 canals in the United States, as well as all the principal rail roads in both countries. The leading points in those great works, are not always so much what they cost, as what is their relative value in their use.

After a complete examination of the whole subject, the engineers come to the following conclusion, (page 250.)

"In regard to their relative merits, as *affording the means of transportation*, there is less difficulty in reaching an approximate ratio. In reducing them both to a level, we attain for general purposes, a par standard of comparison. Taking the facts we have obtained as a basis, we find the relative cost of conveyance is as 4.375 to 1. *A little over four and one-third to one, in favor of Canals*: this is exclusive of tolls or profits." Again they say, [page 250, &c.] "In the preceding computation, the cost of transportation on Rail Roads, is the nett cost, as reported by Rail Road companies, allowing no profit on the business, while the charges on the Canals *is at the contract price*, which is supposed to yield a profit to the carrier."

In the year 1828, Moncure Robinson was appointed by the Canal Commissioners of the State of Pennsylvania, to examine and report a survey of basins, canal and rail way routes between the waters of the Delaware and Susqehanna, and in his report of 4th December, 1828, he states:*—"A full examination of the whole dividing country between the north branch of the Susqehanna, and the tributaries of the Delaware, commencing at the head of the Schuylkill, and continued as far as the sources of the Lehigh, is conclusive of what had been before believed, *that no route, presents facilities for the construction of a Canal*, deserving of consideration, *with the exception of the Valley of the Nescopeck*. One branch of this stream heads within two miles of the Lehigh, at a point where the Lehigh affords a sufficient volume of water at all seasons for a lock and dam Navigation. The whole length of the Canal as traced (from the mouth of Wright's Creek on th eLehigh, and down the Valley of the Nescopeck, to its intersection with the north branch of Susquehanna opposite Berwick) is 37 28.100 miles, and the whole fall to be overcome both ways is 1038 501.1000 feet. The estimated cost exclusive of lockage, &c. is $424,955
1038 feet lockage, at $450 per foot, 467,000

Total estimate from Lehigh to the Susquehanna, $894,955

It remains to mention the most formidable obstacle in the way of the Canal. This is unquestionably the lockage."

We here have the examination and opinion of one of the ablest civil engineers in our country. It will however be recollected that the examination and opinion were given as long ago as 1828, being then in the incipient stages of our canalling in Pennsylvania, since which time there has been such an advance in the science, that what was then deemed insurmountable, has entirely yielded to further ingenuity and experience.

Moncure Robinson's difficulty about the great lockage is one that further light and experience have essentially removed. It has been proved that doubling the height of the lifts he recommended involves no difficulties, and also that a lock of the high lift does not take one-fourth of one minute longer to pass than one of the low lifts, and further that a 20 feet lift does not requre more than 3 minutes to pass it, or say but half the time it usually took in 1828 to pass a 5 feet lift.

By resorting to the new and improved high lift on the Lehigh and on the Susquehanna and Lehigh Canal, there will be about 82 locks on the 63½ miles from Berwick to Maunch Chunk; and from Berwick to Philadelphia, or to New Brunswick, there will be about 152 locks, being about the same number for the distance, as on the Schuylkill and Union Canals from Philadelphia to Middletown. The nvigation throughout is calculated for five feet water, and for boats of 75 tons burthen.

We are therefore of the opinion that there is no canal stock in the state that presents equal advantage to subscribers, with the one now offered to the public.

It may be asked how it has happened that a line for a canal possesing so many advantages, should have been so long suffered to lie dormant, after a charter for the formation of a company to construct it had been obtained. The reply is, that the Canal is a link in the *middle* of a chain, and it is only *now* that the links connecting it with the markets are about to be supplied; to have constructed it before, would have been unnecessary and useless.

* See Reg. Vol. III. p. p. 54, 68.

UNIVERSITY OF PENNSYLVANIA.

At a meeting of the Trustees of the University, held on Tuesday evening, Dr. Samuel Jackson was elected Professor of the Institutes of Medicine, and Dr. George B. Wood, Professor of Materia Medica.

West Philadelphia Canal.—On Monday, 5th inst. the first vessel passed through this Canal, and anchored at Race street wharf on the Schuylkill.—*Commercial Herald.*

BANK OF THE UNITED STATES.

We published the state of the Bank of the United States on the 1st of September. We are now enabled to give that of the first of the present month, with its progressive changes; and by way of illustration, add a similar statement for last year.

State of the Bank from June 1st, 1835, to October 1st, 1835.

1835.	Loans.	Bills of Exchange.	Totals.	Circulation.	Specie.	Funds in Europe.	Due to State Banks.
June 1,	38,787,793 57	24,854,852 47	63,642,646 04	22,009,474 40	13,912,577 47	2,007,146 45	691,699 50
July 1,	40,221,638 99	24,976,053 92	65,197,692 91	25,332,820 16	13,429,328 74	2,378,669 57	2,065,655 71
Aug. 1,	40,116,613 27	24,197,904 95	64,314,518 22	24,329,222 95	12,883,968 43	2,258,886 94	1,793,921 04
Sept. 1,	40,265,325 76	21,521,694 70	61,787,020 46	23,645,122 66	12,440,781 31	1,885,136 89	946,445 63
Oct. 1,	40,339,643 96	19,823,605 43	60,163,249 39	24,403,074 16	12,545,652 82	1,810,898 09	651,995 42

State of the Bank from June 1st, 1834, to October 1st, 1834.

1834.	Loans.	Bills of Exchange.	Totals.	Circulation.	Specie.	Funds in Europe.	Due from State Banks.	Due to St. Bks.
June 1,	34,739,871 21	17,462,041 67	52,201,912 88	16,612,527 06	12,298,333 20	1,995,291 80	1,622,076 91	408,726 34
July 1,	34,423,921 72	16,601,051	51,024,972 72	16,641,997 90	12,823,997 93	3,827,413 03		
Aug. 1,	34,744,116 99	13,932,049 90	48,676,166 89	16,469,342 90	13,626,049 63	4,338,372 07	530,972 26	
Sept. 1,	34,863,326 55	12,196,172 10	47,059,498 65	15,298,577 90	13,863,897 99	3,859,820 92	400,837 73	
Oct. 1,	35,122,840 54	10,883,931 21	46,006,791 75	15,637,676 47	15,561,374,98	3,127,982 88	818,710 20	

The mail is now transported between Philadelphia and Boston in 36 hours. Eighty years ago, it is said, it required 21 days. *So much for Internal Improvements.*

On Monday last, Dr. W. W. Gerhard was elected one of the attending physicians to the Infirmary of the Philadelphia Almshouse.

WARD ELECTION RETURNS.

The following is the result of the Election held on Friday, October 2d, in the different Wards and Districts in the City and County of Philadelphia, so far as heard from; taken from the Daily Papers.

Names of the Wards.	*Ritner.*	*Wolf.*	*Muhl.*	*Totals.*
Upper Delaware,	226	106	101	433
Lower Lelaware	321	52	94	467
High Street	225	52	36	313
Chestnut	177	0	68	245
Walnut	177	15	19	211
Dock	250	0	0	250
Pine	248	0	78	326
New Market	288	256	0	544
North Mulberry	287	280	0	567
South Mulberry	305	155	0	460
North	361	91	0	452
Middle	242	81	0	323
South	256	0	0	256
Locust	267	0	208	475
Cedar	308	0	50	358
Totals,	3938	1088	654	5680

The votes of the Whigs amount to 3938
Wolf and Muhlenberg votes, 1742

Majority of the Whigs, 2196

Poulson's Dai. Adv.

SOUTHWARK.

Whig vote, 443
Wolf " 960
Muhlenberg 177

MOYAMENSING.

Whig vote, 95
Wolf " 215
Muhlenberg 230

PASSYUNK.

Whig vote, 3
Wolf " 33
Muhlenberg 75

BLOCKLEY.

Whig vote, 101
Wolf " 35
Muhlenberg 53

NORTHERN LIBERTIES.

	Ritner.	Wolf.	Muhlenberg.
First Ward	188	166	55
Second,	173	36	57
Third,	225	158	00
Fourth,	237	99	29
Fifth Whig majority	117		
Sixth,	138	217	119
Seventh,	149	84	143
	1227	560	403

DIVIDENDS.

Franklin Fire Insurance Company, 4 per cent.
American do do 4 "

Printed every Saturday morning by WILLIAM F. GEDDES, No. 9 Library street.

The publication office of the Register has been removed from Franklin Place, to No. 61, in the Arcade, West Avenue, up stairs.